

Land Preparation and Field Operations

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One of the most important requirement for crop production in agriculture is to conduct different field operations at the proper time during the crop growth period and after crop harvest. The field operations must be cost effective, labor saving, and efficient.



Pre-sowing and After Harvest of Postrainy Season Crop

Plowing of land soon after the harvest of postrainy season crop is beneficial as given below:

- Easy for farm operations with available moisture (less draft requirement).
- Summer reconditioning of soil occurs thereby killing pests and pathogens.
- Harrowing and cultivation with summer rains will be easy.
- Proper seedbed preparation or broadbed-and-furrow (BBF) layout for sowing is on time.
- Less weed infestation in the following rainy season crop.

The above operations are done with the help of bullock-drawn tropicultor, with multipurpose tool bar attachment for all field operations. Even local implements with bullocks and tractor mounted implements can be used for the operations.

Improved Land Management System



Land preparations for layout of BBF system on grade requires plowing after the harvest of postrainy season crop. With summer rains, harrowing and cultivation help to make a good BBF system layout for growing the next rainy season intercrop or sequential crop. Using the existing natural drains by shaping into a parabola and putting grass all along the drain, a grassed waterway is formed. Broadbed-and-furrow are made on grade from ridgeline to waterway by fixing a key line of 0.6% (0.4–0.8%) grade. A tractor or tropicultor attached with two ridgers 150 cm apart and with chain or wooden plank for

proper bed shaping is used. The operations are continued until there is a change in keyline and the beds and furrows are formed one after another using furrow as the baseline of the recently formed BBF. The total width of BBF system is 150 cm. The bed width is 100 cm; this is the crop zone for growing different crops. The furrow is 50 cm wide and 15 cm deep which serves as a traffic zone as well as for draining excess runoff water during the rainy season.

Advantages of BBF System

- Better moisture conservation, good surface water management, and better disposal of excess water.
- Reduction of soil erosion and nutrient loss.
- All field operations are faster and labor saving.
- Better crop establishment, higher yields and profits.
- Convenient for supplemental irrigation during post-rainy season crop.
- Less soil compaction in the cropped area (bed) and improved soil physical characteristics.



Sowing and Fertilizer Application

Tropicultr mounted seed-cum-fertilizer drill is used for sowing different crops and combinations with required row and plant spacing on BBF and flat on graded contour. Sowing under dry soil conditions, one week before rainy season helps in easy operation in black soils (except for oilseed crops). The seed required for different crops as per the recommended practices is used. The fertilizer required for the initial crop establishment is applied conveniently at the time of sowing as per the recommendation. Top dressing is generally with a nitrogen fertilizer (urea) and applied 30 days after sowing. The advantages of seed-cum-fertilizer drill are:

- Proper establishment of crop in exact row and plant spacing arrangements.
- Less weed problems, and suitable for interculture operations.
- Seed and fertilizer placement is uniform in required quantities and at proper depth of application.
- Easy operation, more area covered in less time, saves labor.
- Sowing of various intercrops and sequential crops is possible.



Interculture Operations

Interculture operation is faster and the time required is reduced because of the furrows. The cultivator mounted on tropicultr with required number of rows and spacing is used along with ridgers (without wings) for furrow shaping. The operations are done generally at 21 and 45 days after sowing the crop. The interculture operation in soybean, maize, or sorghum crop is done until the crop



height reaches about 75 cm. The area covered is large and per unit time requirement of labor for weeding is reduced. Interculture operation helps in loosening the soil for rainwater infiltration between the rows. Weeding is done by laborers when required.

Harvesting Rainy Season Crop and Planting Postrainy Season Crop

Soybean, maize, and sorghum under sequential and intercropping systems are harvested during October 2nd week. Planting of postrainy season crop (chickpea or safflower) is done immediately in between the harvested rows without any land preparation. Sowing is done with the help of bullock drawn seed-cum-fertilizer drill.

Cropping Systems

Sequential cropping system



The crops are harvested leaving the stubble in the field to preserve the moisture which promotes the establishment and growing of postrainy season crops. There is no additional land preparation required for sowing. Chickpea (4 rows with 30 cm row spacing), safflower (3 rows with 50 cm row spacing), or any other suitable crop can be planted between the rows with stubble. When early withdrawal of rain takes place, moisture availability is not enough to establish the crop in shallow soils. The furrows are used for supplemental irrigation. Deeper soils hold more moisture for postrainy season crops. Therefore,

irrigation is not required for crop establishment. After harvest of chickpea crop the land needs to be plowed and left for summer reconditioning and preparation of a good seedbed for next cropping season. The major cropping patterns are:

- Maize (2 rows at 75 cm spacing) + chickpea (4 rows at 30 cm spacing).
- Sorghum (3 rows at 50 cm spacing) + chickpea (4 rows at 30 cm spacing).
- Soybean (4 rows at 30 cm spacing) + chickpea (4 rows at 30 cm spacing).

Intercropping system

Rainy season crops such as maize, sorghum, and soybean can be planted along with pigeonpea. These crops are harvested in October. In the intercropping system, long-duration pigeonpea remains until February of the following year. After harvest of pigeonpea the land is plowed and left for summer reconditioning and preparation of a good seedbed for next cropping season. The cropping patterns used are:

- Maize/pigeonpea (2 rows at 50 cm + 1 row at 150 cm spacing).
- Sorghum/pigeonpea (2 rows at 50 cm + 1 row at 150 cm spacing).
- Soybean/pigeonpea (4 rows at 22.5 cm + 1 row at 150 cm spacing).

